Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

December 27, 2010

Mr. Kelly Madalinski
Port of Portland
7200 NE Airport Way
Portland, Oregon 97218

Re: Proposed Surface Soil Sampling — Operable Unit 2
Swan Island Upland Facility
Portland, Oregon
ECSI No. 271
1115-05

Dear Mr. Madalinski:

This letter presents the proposed surface soil sampling activities to support the preparation of an addendum to the *Source Control Evaluation* (SCE; April 15, 2010) for Operable Unit 2 (the Facility or OU2) at the Swan Island Upland Facility (SIUF) in Portland, Oregon (Figures 1 and 2). The Port of Portland (Port) is under a Voluntary Cleanup Program (VCP) Agreement with the Oregon Department of Environmental Quality (DEQ) for Remedial Investigation (RI), Source Control Measures (SCMs), and Feasibility Study (FS) at the Facility (dated July 24, 2006). The proposed activities presented in this letter include collection of surface soil samples for chemical analysis.

BACKGROUND

Historical Substation A. Review of additional historical documents completed after submittal of the OU2 SCE (as part of the forthcoming OU4 SCE) provided clarification of the location of one of the historical military-era electrical substations. Substation A was apparently located on the platform elevated above the OU2 riverbank (Figure 3). This area has not been previously sampled. A site visit was conducted on May 19, 2010 to review the platform (Photographs 1 and 2; Attachment A). The field observations from the site visit suggest that this is a former substation location. Sets of bolt-down locations were observed on the top of the concrete platform (Photograph 3) each associated with a large diameter heavy-gauge conduit installed vertically through the platform. On the underside of the platform nine conduits were observed that ran to the northwest (Photograph 4) and one that ran into the riverbank to the northeast. The electrical equipment appeared to be located on the northern portion of the platform. No evidence of staining was observed under the platform.

Tributyltin (TBT) Storm Water Screening. The DEQ provided comments on the SCE in a letter dated August 9, 2010. The proposed sampling described in this letter also responds to the following DEQ comment.

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DEQ Specific Comment 1: Page 16, Section 4.3.1 (Data Screening) Storm Water Pathway. TBT was not evaluated in the stormwater pathway. TBT was not analyzed in surface soil around catch basins, cleanout solids samples or on the bank below outfall WR-164 because no source was identified in this area. However, in subsequent sampling TBT was detected in all three riverbank composite samples in which it was collected in OU2. The source of TBT in OU2 has not been identified. Additional evaluation of the stormwater pathway for TBT transport to the river is needed.

PROPOSED SAMPLING ACTIVITIES

Preparatory Activities

The following activities and schedule coordination will be completed in preparation for the field work.

- Health and Safety Plan (HASP). Ash Creek Associates (Ash Creek) will prepare a HASP for its personnel involved with the project.
- Underground Utility Location. An underground utility locate will be conducted by prior to the sampling activities.
- Work in Tenant Areas. The work activities will be conducted in coordination with tenant schedules.

Surface Soil Sampling

Historical Substation A. One four-point composite surface soil sample will be collected below the platform beneath the area observed to have historically included the electrical equipment (Figure 3). A second four-point composite surface soil sample will be collected on the riverbank downslope of the platform (above the OLHW). The sub-sample locations within each composite sample area will be located at equally spaced distances in a staggered pattern. Discrete samples from each sub-sample location will also be collected and retained for potential future analysis. Surface soil will be collected from a depth of 0 to 1 foot at the four discrete sub-sample locations within each of the composite sample areas. The samples will be collected in accordance with Standard Operating Procedure (SOP) 2.2 (Attachment B). The samples will be field screened for volatile organic compounds (VOCs) using a photoionization detector (PID) and for the presence of petroleum hydrocarbons using a sheen test in accordance with SOP 2.1.

The sample locations will be recorded using a high-accuracy, handheld global positioning system (GPS) device (Trimble© GeoXH™).

TBT Surface Soil Sampling. One composite surface soil sample will be collected from inside a 100-foot radius surrounding the catch basin and analyzed for TBT. The proposed discrete sample locations making up each composite sample are shown on Figure 4. Surface soil will be collected from a depth of 0 to 6 inches at the four discrete sub-sample locations. The samples will be collected in accordance with SOP 2.2 with the following modification: Prior to placement of samples into the sample container, soil will be passed through a No. 4 sieve to remove gravel-size particles. Discrete samples from each sub-sample location will also be collected and retained for potential future analysis. The samples will be field screened for VOCs using a PID and for the presence of petroleum hydrocarbons using a sheen test in accordance with SOP 2.1.

The sample locations will be recorded using a high-accuracy, handheld global positioning system GPS device.

CHEMICAL ANALYSES

The soil samples will be submitted for chemical analyses on a normal turnaround basis for the following constituents of interest (COIs).

Historical Substation A

- Diesel and oil-range TPH by Northwest Method NWTPH-Dx (with silica gel cleanup); and
- Polychlorinated biphenyls (PCBs) by EPA Method 8082 (Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268).

TBT Surface Soil Sampling

- TBT by the Krone Method.

REPORTING

The results of the sampling will be presented in the SCE addendum.

If you have any questions regarding these activities, please contact the undersigned at (503) 924-4704.

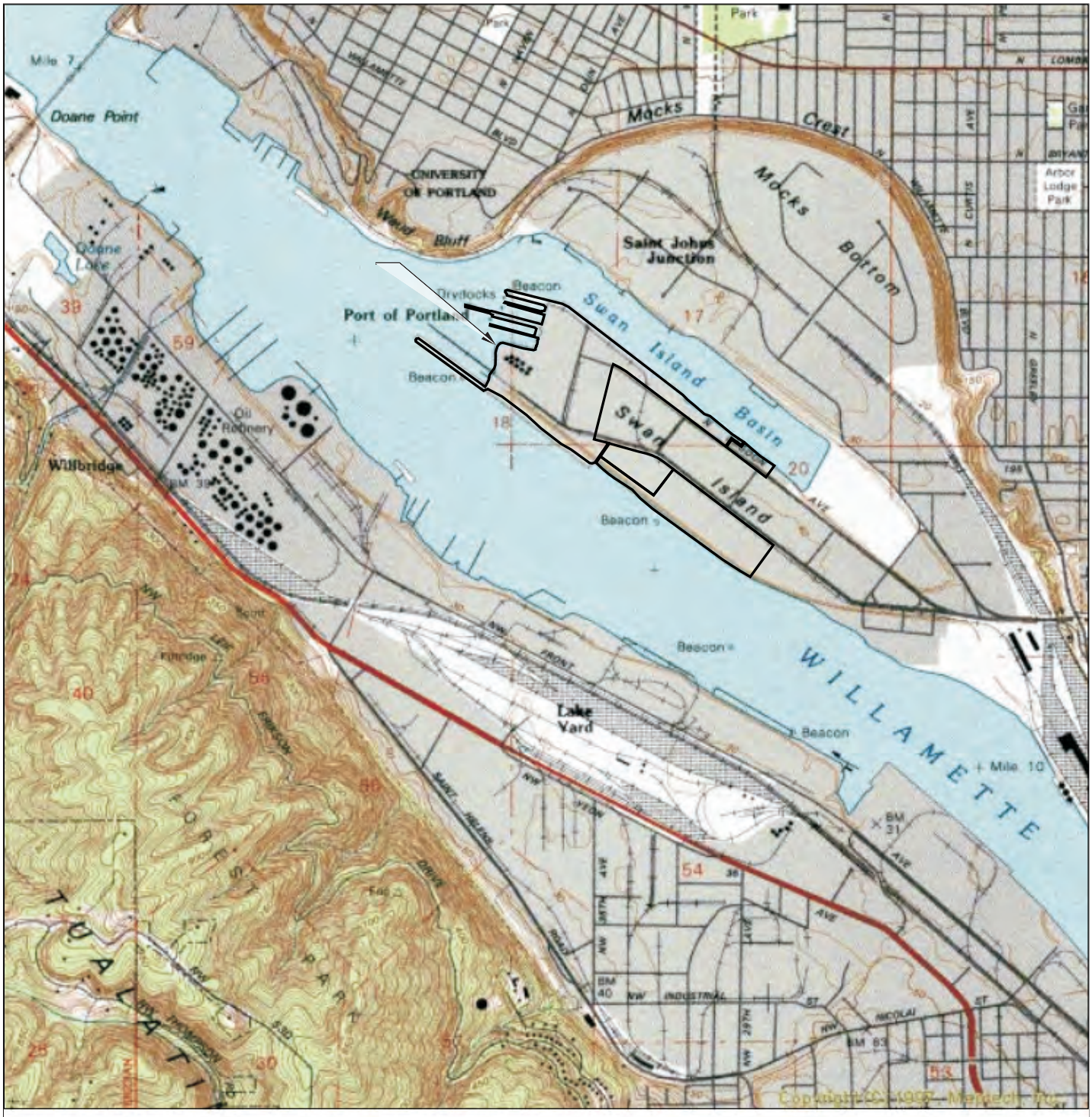
Sincerely,

Michael J. Pickering, R.G.
Associate Hydrogeologist

ATTACHMENTS

Figure 1 – Facility Location Map
Figure 2 – Facility Vicinity Map
Figure 3 – Proposed Sampling Plan – Substation A
Figure 4 – Proposed Sampling Plan – Catch Basin

Attachment A – Photograph Log
Attachment B – Standard Operating Procedures 2.1 and 2.2



NOTE: Base map prepared from USGS 7.5-minute quadrangles as provided by Topozone. (1990)

0 2,000 4,000

Approximate Scale in Feet

N

Facility Location Map

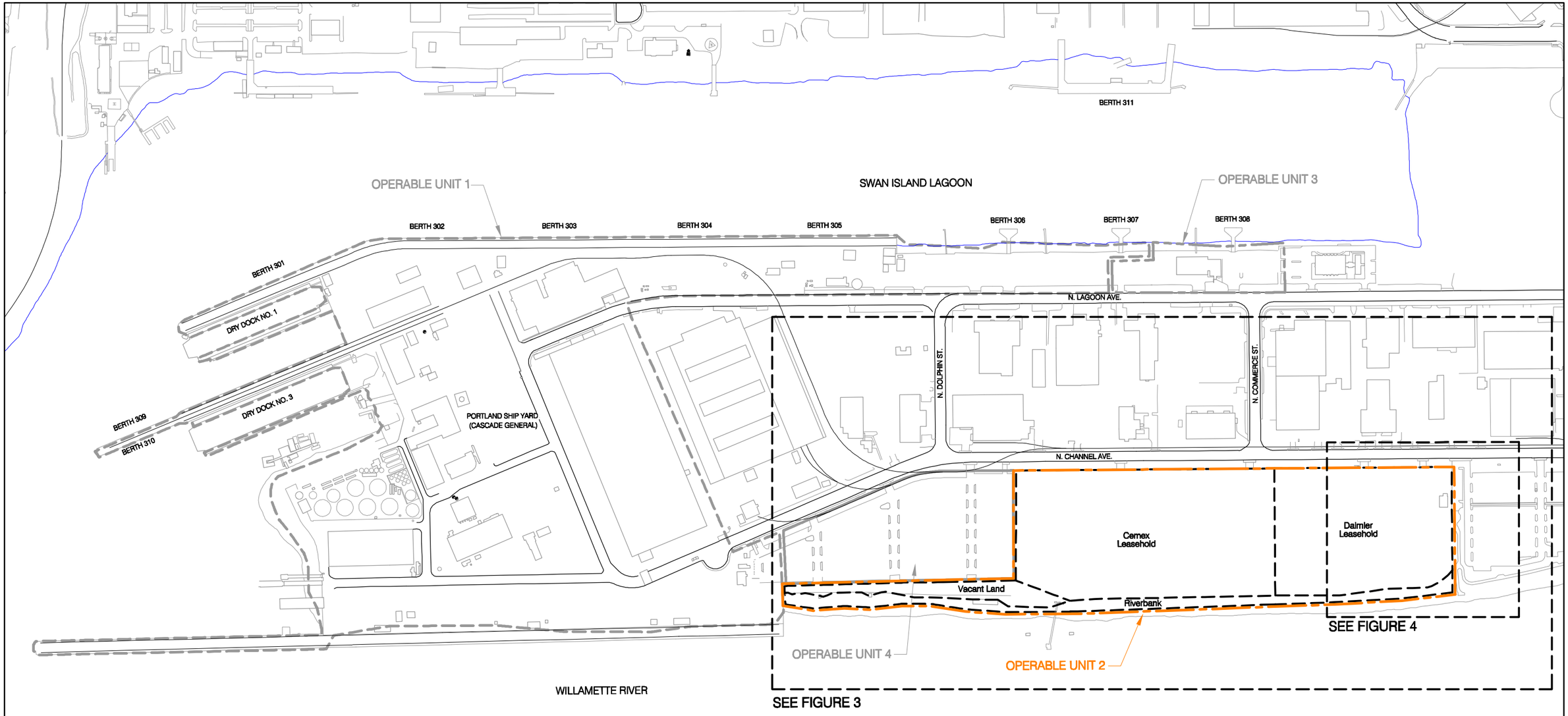
Proposed Surface Soil Sampling Letter
Swan Island Upland Facility Operable Unit 2
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number 1115-05

September 2010

Figure 1



Legend:

- Operable Unit 1 Boundary
- Operable Unit 2 Boundary
- Operable Unit 3 Boundary
- Operable Unit 4 Boundary
- Exposure Area and Designation

N

0 400 800

Scale in Feet

NOTE:
1. Prepared from AutoCAD base map received from the Port of Portland in June 2007.

Facility Vicinity Plan

Proposed Surface Soil Sampling Letter
Swan Island Upland Facility Operable Unit 2
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

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Legend:

○ Proposed Discrete Sample Location

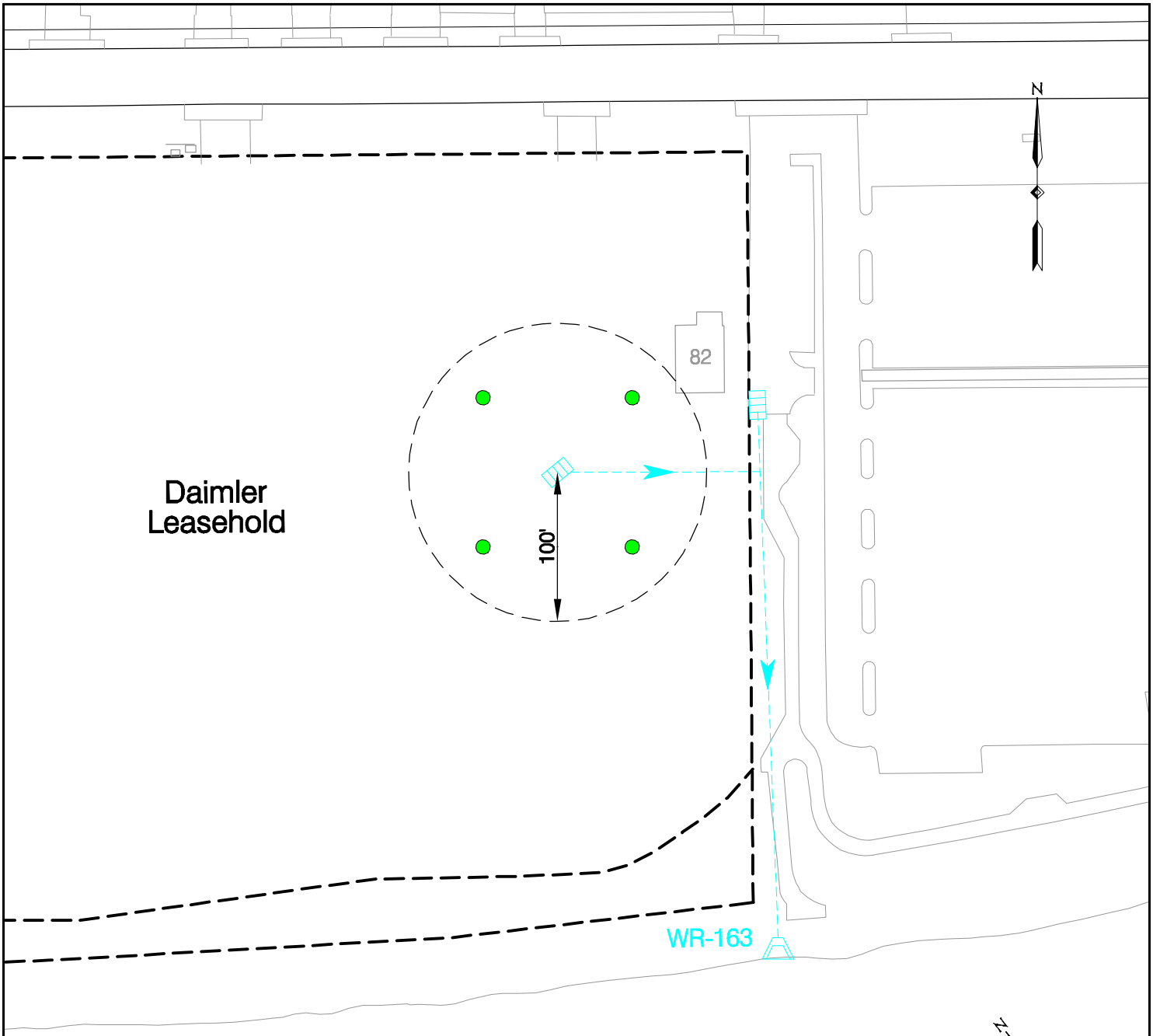
NOTES:

1. Prepared from AutoCAD base map received from the Port of Portland in June 2007.
2. Aerial photograph from from 2010 - Google Imagery. Aerial dated 2008.

Proposed Sampling Plan - Substation A

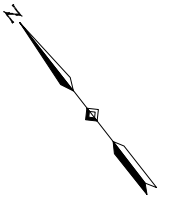
Proposed Surface Soil Sampling Letter
Swan Island Upland Facility Operable Unit 2
Portland, Oregon

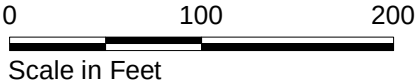
Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number 1115-05	Figure 3
	October 2010	



Legend:

- Proposed Discrete Sample Location
- Catch Basin
- WR-163 Outfall Location
- Stormwater Line and Flow DIrection





NOTES:
1. Prepared from AutoCAD base map received from the Port of Portland in June 2007.

Proposed Sampling Plan - Catch Basin

Proposed Surface Soil Sampling Letter
Swan Island Upland Facility Operable Unit 2
Portland, Oregon

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number	1115-05	Figure 4
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Attachment A

Photograph Log

Attachment A
PHOTOGRAPH LOG

Project Name: Swan Island Upland Facility, OU2
Project Number: 1115-05

Client: Port of Portland
Location: Portland, Oregon

Photo No: 1	
Photo Date: May 19, 2010	
Orientation: Northwest	
Description: Elevated platform on riverbank that previously housed the historical military-era Substation A.	

Photo No: 2	
Photo Date: May 19, 2010	
Orientation: Northwest	
Description: Riverbank area under platform. No evidence of staining was observed under the platform.	

Attachment A
PHOTOGRAPH LOG

Project Name: Swan Island Upland Facility, OU2
Project Number: 1115-05

Client: Port of Portland
Location: Portland, Oregon

Photo No: 3	
Photo Date: May 19, 2010	
Orientation: Not Applicable	
Description: Bolt-down holes observed on the top of the concrete platform associated with a large diameter heavy-gauge conduit installed vertically through the platform (in white circle).	

Photo No: 4	
Photo Date: May 19, 2010	
Orientation: Northwest	
Description: Conduits that ran from the top of the platform distribution network.	

Attachment B

Standard Operating Procedures 2.1 and 2.2

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides instructions for standard field screening. Field screening results are used to aid in the selection of soil samples for chemical analysis. This procedure is applicable during all Ash Creek Associates (ACA) soil sampling operations.

Standard field screening techniques include the use of a photoionization detector (PID) to assess for volatile organic compounds (VOCs), for the presence of separate-phase petroleum hydrocarbons using a sheen test. These methods will not detect all potential contaminants, so selection of screening techniques shall be based on an understanding of the site history. The PID is not compound or concentration-specific, but it can provide a qualitative indication of the presence of VOCs. PID measurements are affected by other field parameters such as temperature and soil moisture. Other field screening methods, such as screening for dense non-aqueous phase liquid (DNAPL) using dye or UV light, are not considered "standard" and will be detailed in the site-specific sampling and analysis plan (SAP).

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- PID with calibration gas (record daily calibration/calibration check in field notes);
- Plastic resealable bags (for PID measurement); and
- Glass jars or stainless steel bowls (for sheen testing).

3. METHODOLOGY

Each soil sample will be field screened for VOCs using a PID and for the presence of separate-phase petroleum hydrocarbons using a sheen test. If the presence of DNAPL is suspected, then screening using dye and UV light may also to be completed. For information regarding screening using dye or UV light, refer to the site specific sampling and analysis plan.

PID lamps come in multiple sizes, typically 9.8, 10.6, and 11.7 electron volts (eV). The eV rating for the lamp must be greater than the ionization potential (in eV) of a compound in order for the PID to detect the compound. For petroleum hydrocarbons, a lamp of at least 9.8 eV should be used. For typical chlorinated alkenes (dichloroethene, trichloroethene, tetrachloroethene, or vinyl chloride.), a lamp of at least 10.6 eV should be used. The compatibility of the lamp size with the site constituents should be verified prior to the field event and will be detailed in the site-specific SAP.

PID Calibration Procedure: The PID used on-site should be calibrated daily or more frequently if needed. Calibration of the PID should be documented in field notes. Calibrations procedures should be conducted according to the manufacturer's instructions. .

<u>PID Screening Procedure:</u>

- Place a representative portion (approximately one ounce) of freshly exposed, uncompacted soil into a clean resealable plastic bag.
- Seal the bag and break up the soil to expose vapors from the soil matrix.
- Allow the bag to sit to reach ambient temperature. Note: Ambient temperature and weather conditions/humidity should be recorded in field notes. Changes in ambient temperature and weather during the field work should also be recorded, as temperature and humidity can affect PID readings.
- Carefully insert the intake port of the PID into the plastic bag.
- Record the PID measurement in the field notes or boring logs.

<u>Sheen Test Procedure:</u>

- Following the PID screen, place approximately one ounce of freshly exposed, uncompacted soil into a clean glass jar or stainless steel bowl.

- Add enough water to cover the sample.
- Observe the water surface for signs of discoloration/sheen and characterize

No Sheen (NS)	No visible sheen on the water surface
Biogenic Film (BF)	Dull, platy/blocky or foamy film.
Slight Sheen (SS)	Light sheen with irregular spread, not rapid. May have small spots of color/iridescence. Majority of water surface not covered by sheen.
Moderate Sheen (MS)	Medium to heavy coverage, some color/iridescence, spread is irregular to flowing. Sheen covering a large portion of water surface.
Heavy Sheen (HS)	Heavy sheen coverage with color/iridescence, spread is rapid, entire water surface covered with sheen. Separate-phase hydrocarbons may be evident during sheen test.

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods used for obtaining surface soil samples for physical and/or chemical analysis. For purposes of this SOP, surface soil (including shallow subsurface soil) is loosely defined as soil that is present within 3 feet of the ground surface at the time of sampling. Various types of sampling equipment are used to collect surface soil samples including spoons, scoops, trowels, shovels, and hand augers.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Spoons, scoops, trowels, shovels, and/or hand augers. Stainless steel is preferred.
- Stainless steel bowls
- Laboratory-supplied sample containers
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by Health and Safety Plan)

3. METHODOLOGY

Project-specific requirements will generally dictate the preferred type of sampling equipment used at a particular site. The following parameters should be considered: sampling depth, soil density, soil moisture, use of analyses (e.g., chemical versus physical testing), type of analyses (e.g., volatile versus non-volatile). Analytical testing requirements will indicate sample volume requirements that also will influence the selection of the appropriate type of sampling tool. The project sampling plan should define the specific requirements for collection of surface soil samples at a particular site.

Collection of Samples

- Volatile Analyses. Surface soil sampling for volatile organics analysis (VOA) is different than other routine physical or chemical testing because of the potential loss of volatiles during sampling. To limit volatile loss, the soil sample must be obtained as quickly and as directly as possible. If a VOA sample is to collected as part of a multiple analyte sample, the VOA sample portion will be obtained first. The VOA sample should be obtained from a discrete portion of the entire collected sample and should not be composited or homogenized. Sample bottles should be filled to capacity, with no headspace. Specific procedures for collecting VOA samples using the EPA Method 5035 are discussed in SOP 2-7.
- Other Analyses. Once the targeted sample interval has been collected, the soil sample will be thoroughly homogenized in a stainless steel bowl prior to bottling. Sample homogenizing is accomplished by manually mixing the entire soil sample in the stainless steel bowl with the sampling tool or with a clean teaspoon or spatula until a uniform mixture is achieved. If packing of the samples into the bottles is necessary, a clean stainless steel teaspoon or spatula may be used.

General Sampling Procedure:

- Decontaminate sampling equipment in accordance with the Sampling and Analysis Plan (SAP) before and after each individual soil sample.
- Remove surface debris that blocks access to the actual soil surface or loosen dense surface soils, such as those encountered in heavy traffic areas. If sampling equipment is used to remove surface debris,

the equipment should be decontaminated prior to sampling to reduce the potential for sample interferences.

- When using a hand auger, push and rotate downward until the auger becomes filled with soil. Usually a 6- to 12-inch long core of soil is obtained each time the auger is inserted. Once filled, remove the auger from the ground and empty into a stainless steel bowl. If a VOA sample is required, the sample should be taken directly from the auger using a teaspoon or spatula and/or directly filling the sample container from the auger. Repeat the augering process until the desired sample interval has been augered and placed into the stainless steel bowl.

Backfilling Sample Locations:

Backfill in accordance with federal and state regulations including OAR 690-240 (e.g., bentonite requirements). The soils from the excavation will be used as backfill unless project-specific or state requirements include the use of clean backfill material.